

# SEQUENCE LISTING

<110> Porro, Danilo  
Sauer, Michael

<120> Ascorbic Acid Production from Yeast

<130> 2028.594000

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<170> PatentIn Ver. 2.1

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<210> 9

<211> 440

<212> PRT

<213> Rattus norvegicus

<400> 9

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Tyr Gly Cys Ser Pro Glu Val Tyr Tyr Gln Pro Thr Ser Val Glu Glu  
20 25 30

Val Arg Glu Val Leu Ala Leu Ala Arg Glu Gln Lys Lys Lys Val Lys  
35 40 45

Val Val Gly Gly Gly His Ser Pro Ser Asp Ile Ala Cys Thr Asp Gly  
50 55 60

Phe Met Ile His Met Gly Lys Met Asn Arg Val Leu Gln Val Asp Lys  
65 70 75 80

Glu Lys Lys Gln Ile Thr Val Glu Ala Gly Ile Leu Leu Ala Asp Leu  
85 90 95

His Pro Gln Leu Asp Glu His Gly Leu Ala Met Ser Asn Leu Gly Ala  
100 105 110

Val Ser Asp Val Thr Val Ala Gly Val Ile Gly Ser Gly Thr His Asn  
115 120 125

Thr Gly Ile Lys His Gly Ile Leu Ala Thr Gln Val Val Ala Leu Thr  
130 135 140

Leu Met Thr Ala Asp Gly Glu Val Leu Glu Cys Ser Glu Ser Arg Asn  
145 150 155 160

Ala Asp Val Phe Gln Ala Ala Arg Val His Leu Gly Cys Leu Gly Ile  
165 170 175

Ile Leu Thr Val Thr Leu Gln Cys Val Pro Gln Phe Gln Leu Gln Glu  
180 185 190

Thr Ser Phe Pro Ser Thr Leu Lys Glu Val Leu Asp Asn Leu Asp Ser  
195 200 205

His Leu Lys Arg Ser Glu Tyr Phe Arg Phe Leu Trp Phe Pro His Thr  
210 215 220

Glu Asn Val Ser Ile Ile Tyr Gln Asp His Thr Asn Lys Ala Pro Ser  
 225 230 235 240  
 Ser Ala Ser Asn Trp Phe Trp Asp Tyr Ala Ile Gly Phe Tyr Leu Leu  
 245 250 255  
 Glu Phe Leu Leu Trp Thr Ser Thr Tyr Leu Pro Cys Leu Val Gly Trp  
 260 265 270  
 Ile Asn Arg Phe Phe Phe Trp Met Leu Phe Asn Cys Lys Lys Glu Ser  
 275 280 285  
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 His Val Gln Asp Trp Ala Ile Pro Arg Glu Lys Thr Lys Glu Ala Leu  
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 325 330 335  
 Tyr Pro Val Glu Val Arg Phe Thr Arg Gly Asp Asp Ile Leu Leu Ser  
 340 345 350  
 Pro Cys Phe Gln Arg Asp Ser Cys Tyr Met Asn Ile Ile Met Tyr Arg  
 355 360 365  
 Pro Tyr Gly Lys Asp Val Pro Arg Leu Asp Tyr Trp Leu Ala Tyr Glu  
 370 375 380  
 Thr Ile Met Lys Lys Phe Gly Gly Arg Pro His Trp Ala Lys Ala His  
 385 390 395 400  
 Asn Cys Thr Gln Lys Asp Phe Glu Glu Met Tyr Pro Thr Phe His Lys  
 405 410 415  
 Phe Cys Asp Ile Arg Glu Lys Leu Asp Pro Thr Gly Met Phe Leu Asn  
 420 425 430  
 Ser Tyr Leu Glu Lys Val Phe Tyr  
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<210> 10

<211> 2120

<212> DNA

<213> Rattus norvegicus

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 <212> PRT  
 <213> *Arabidopsis thaliana*

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Val Ala Glu Asp Asp Ala Val Ala Thr Val Arg Glu Ala Phe Arg Leu
    35             40             45

Gly Ile Asn Phe Phe Asp Thr Ser Pro Tyr Tyr Gly Gly Thr Leu Ser
    50             55             60

Glu Lys Met Leu Gly Lys Gly Leu Lys Ala Leu Gln Val Pro Arg Ser
    65             70             75             80

Asp Tyr Ile Val Ala Thr Lys Cys Gly Arg Tyr Lys Glu Gly Phe Asp
    85             90             95

Phe Ser Ala Glu Arg Val Arg Lys Ser Ile Asp Glu Ser Leu Glu Arg
    100            105            110

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Leu Gln Leu Asp Tyr Val Asp Ile Leu His Cys His Asp Ile Glu Phe  
 115 120 125  
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 130 135 140  
 Leu Lys Gln Glu Gly Lys Thr Arg Phe Ile Gly Ile Thr Gly Leu Pro  
 145 150 155 160  
 Leu Asp Ile Phe Thr Tyr Val Leu Asp Arg Val Pro Pro Gly Thr Val  
 165 170 175  
 Asp Val Ile Leu Ser Tyr Cys His Tyr Gly Val Asn Asp Ser Thr Leu  
 180 185 190  
 Leu Asp Leu Leu Pro Tyr Leu Lys Ser Lys Gly Val Gly Val Ile Ser  
 195 200 205  
 Ala Ser Pro Leu Ala Met Gly Leu Leu Thr Glu Gln Gly Pro Pro Glu  
 210 215 220  
 Trp His Pro Ala Ser Pro Glu Leu Lys Ser Ala Ser Lys Ala Ala Val  
 225 230 235 240  
 Ala His Cys Lys Ser Lys Gly Lys Lys Ile Thr Lys Leu Ala Leu Gln  
 245 250 255  
 Tyr Ser Leu Ala Asn Lys Glu Ile Ser Ser Val Leu Val Gly Met Ser  
 260 265 270  
 Ser Val Ser Gln Val Glu Glu Asn Val Ala Ala Val Thr Glu Leu Glu  
 275 280 285  
 Ser Leu Gly Met Asp Gln Glu Thr Leu Ser Glu Val Glu Ala Ile Leu  
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 Glu Pro Val Lys Asn Leu Thr Trp Pro Ser Gly Ile His Gln Asn  
 305 310 315

<210> 12  
 <211> 960  
 <212> DNA  
 <213> *Arabidopsis thaliana*

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 accgtgcgcg aggttttccg tctcggtatc aacttcttcg acacctcccc gtattatgga 180  
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 gactacattg tggctactaa gtgtggtaga tataaagaag gttttgattt cagtgtctgag 300  
 agagtaagaa agagtattga cgagagcttg gagaggcttc agcttgatta tgttgacata 360  
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<210> 13

<211> 18

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: motif I of  
 aldo-keto reductase superfamily

<220>

<221> VARIANT

<222> (2)

<223> Xaa = any amino acid

<220>

<221> VARIANT

<222> (4)..(5)

<223> Xaa = any amino acid

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<222> (15)..(17)

<223> Xaa = any amino acid

<400> 13

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Xaa Gly

<210> 14

<211> 30

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Forward PCR



Primer for L-galactono-1,4-lactone dehydrogenase  
from *A. thaliana*

<400> 14  
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<210> 15  
<211> 30  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: Reverse PCR  
Primer for L-galactono-1,4-lactone dehydrogenase  
from *A. thaliana*

<400> 15  
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<210> 16  
<211> 26  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: Forward PCR  
Primer for L-gulono-1,4-lactone oxidase from *R. norvegicus*

<400> 16  
tgaggggtca ggggtggttg tttcca 26

<210> 17  
<211> 28  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: Reverse PCR  
Primer for L-gulono-1,4-lactone oxidase from *R. norvegicus*

<400> 17  
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<210> 18  
<211> 22  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: Forward PCR  
Primer for D-arabinono-1,4-lactone oxidase from *S.*

cerevisiae

<400> 18

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22

<210> 19

<211> 22

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Reverse PCR  
Primer for D-arabinono-1,4-lactone oxidase from S.  
cerevisiae

<400> 19

aaggatccta gtcggacaac tc

22

<210> 20

<211> 344

<212> PRT

<213> Saccharomyces cerevisiae

<400> 20

Met Ser Ser Ser Val Ala Ser Thr Glu Asn Ile Val Glu Asn Met Leu  
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His Pro Lys Thr Thr Glu Ile Tyr Phe Ser Leu Asn Asn Gly Val Arg  
20 25 30

Ile Pro Ala Leu Gly Leu Gly Thr Ala Asn Pro His Glu Lys Leu Ala  
35 40 45

Glu Thr Lys Gln Ala Val Lys Ala Ala Ile Lys Ala Gly Tyr Arg His  
50 55 60

Ile Asp Thr Ala Trp Ala Tyr Glu Thr Glu Pro Phe Val Gly Glu Ala  
65 70 75 80

Ile Lys Glu Leu Leu Glu Asp Gly Ser Ile Lys Arg Glu Asp Leu Phe  
85 90 95

Ile Thr Thr Lys Val Trp Pro Val Leu Trp Asp Glu Val Asp Arg Ser  
100 105 110

Leu Asn Glu Ser Leu Lys Ala Leu Gly Leu Glu Tyr Val Asp Leu Leu  
115 120 125

Leu Gln His Trp Pro Leu Cys Phe Glu Lys Ile Lys Asp Pro Lys Gly  
130 135 140

Ile Ser Gly Leu Val Lys Thr Pro Val Asp Asp Ser Gly Lys Thr Met  
145 150 155 160

Tyr Ala Ala Asp Gly Asp Tyr Leu Glu Thr Tyr Lys Gln Leu Glu Lys



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<210> 22

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<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Forward PCR  
 Primer for L-galactose dehydrogenase from A.  
 thaliana

<400> 22

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<210> 23

<211> 24

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Reverse PCR  
 Primer for L-galactose dehydrogenase from A.  
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<400> 23

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<210> 24

<211> 24

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Saccharomyces  
 cerevisiae

<400> 24

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<210> 25

<211> 29

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Reverse PCR  
Primer for D-arabinose dehydrogenase from *S.*  
*cerevisiae*

<400> 25

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29

<210> 26

<211> 4

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: motif II of  
aldo-keto reductase superfamily

<220>

<221> VARIANT

<222> (2)..(3)

<223> Xaa = any amino acid

<400> 26

Gly Xaa Xaa Asn

1